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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/583,813

06/22/2006

Changyin Sun

80170-1040

4899

24504

7590

04/30/2009

THOMAS, KAYDEN, HORSTEMEYER & RISLEY, LLP  
600 GALLERIA PARKWAY, S.E.  
STE 1500  
ATLANTA, GA 30339-5994

EXAMINER

ZHENG PUENTE, EVA YI

ART UNIT

PAPER NUMBER

2611

MAIL DATE

DELIVERY MODE

04/30/2009

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/583,813	<b>Applicant(s)</b> SUN ET AL.	
	<b>Examiner</b> EVA Y. PUENTE	<b>Art Unit</b> 2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 22 June 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 and 2 is/are rejected.
- 7) ☒ Claim(s) 3-9 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 June 2006 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>6/22/06</u> .   | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Drawings***

1. The drawings are objected to because in Fig. 4, block 5 has two outputs. The first output "Yes" feedback to block 4 should be deleted. "Yes" should be add at the second output of block 5, which is send to block 6. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Specification***

2. The disclosure is objected to because of the following informalities: (a) on page 8, line 11, please delete the square symbol after "the corresponding base band receiving signal is". (b) on page 9, line 5, please delete the square symbol after "spreading the equation (5), obtaining".

Appropriate correction is required.

***Claim Objections***

3. Claim 1 is objected to because of the following informalities:

(a) Please delete "Step 1," "Step 2," "Step 3," and Step 4,".

(b) On line 2, please add -- an -- before "equalizer".

(c) On line 4-5, please delete and change to -- pre-training process including sending training sequence and training the equalizer before transmitting user data --.

(d) On line 6, please change "channel tracking process:" to -- channel tracking process including --.

(e) On line 9, please add -- for channel changes -- after "channel".

(f) On line 11, please change "threshold 1" and "threshold 2" to -- first threshold -  
- and -- second threshold --.

4. Claim 2 is objected to because of the following informalities:

(a) On line 2, please delete "with characterized in that" and add -- wherein --.

(b) On line 4, please delete "training" and add -- said training the equalizer --.

5. Claim 3 is objected to because of the following informalities:

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- (a) On line 4, please delete “first” before “using”.
  - (b) On line 6, please delete “then” before “calculating”.
  - (c) On line 13, please delete “decided” before “user”.
6. Claim 4 is objected to because of the following informalities:
- (a) On line 4, please delete “process” after -- estimation --.
  - (b) On line 5, please delete “firstly,” before “generating”.
  - (c) On line 7, please delete “secondly,” before “sampling”.
  - (d) On line 8, please change “then” to -- and --.
7. Claim 5 is objected to because of the following informalities:
- (a) On line 3, please delete “firstly,” before “local”.
  - (b) On line 7, please delete “secondly,” before “sampling”.
  - (c) On line 8, please change “then” to -- and --.
8. Claim 6 is objected to because of the following informalities:
- (a) On line 3, please add -- coefficient -- before “value” and delete “coefficient” before “further”.
9. Claim 7 is objected to because of the following informalities:
- (a) On line 5, please delete “firstly,” before “using”.
  - (b) On line 7, please delete “right” and add -- correct -- before “being”;
- and delete “secondly,” before “inputting”, and add -- and --.
10. Claim 8 is objected to because of the following informalities:
- (a) Please change “threshold 1” and “threshold 2” to -- first threshold -- and -- second threshold --.

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(b) On line 4, please change "exceeding" to -- exceed --.

11. Claim 9 is objected to because of the following informalities:

(a) Please change "threshold 1" and "threshold 2" to -- first threshold -- and -- second threshold --.

Claims appear to be a literal translation into English from a foreign application.

Please check for grammatical error in the claims. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 103***

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

13. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sendyk et al (US 5,268,930).

a) Regarding to claim 1, Sendyk et al disclose a method for uplink burst equalization in broad wide access system, in which equalizer uses a decision feedback equalizer (34 in Fig. 2), comprising the following steps of:

Step 1, pre-training process: before transmitting user data, sending training sequence, and training the equalizer (Training signal on line 6);

Step 2, channel tracking process: recording coefficient after convergence of the equalizer (tapped delay line 8 and 12 record equalizer coefficients when equalizer is convergent), starting transmitting the user data (transmit data signal after preamble in

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TDMA communication system), and the equalizer tracking wireless channel (adder 24, error signal  $e(n)$ , and error detector 38 track channel changes; abstract);

Step 3, entering into a burst equalization process (error signal  $e(n)$  is the difference between  $y(n)$  and  $d(n)$  signal; comparing the error signal with a threshold value in block 38, if there's no error, switch 22 move to 22a position and enters into equalization process); and

Step 4, entering into the pre-training process again if the channel changes result in an error rate exceeding threshold (error signal  $e(n)$  is the difference between  $y(n)$  and  $\hat{y}(n)$  signal; comparing the error signal with a threshold value in block 38, if fading is too deep (inherently exceeding the threshold value), switch 22 move to 22b position and retraining begins; Fig. 3; Col 5, L1-50).

Sendyk et al disclose initial training, retraining, and equalization mode based on channel changes. Sendyk et al does not explicitly disclose two threshold values, i.e., a first and second threshold values. However, in Sendyk et al's system, when the channel experiences deep fading, i.e., exceeding a threshold value, retraining begins. When the channel is free of error, i.e., less than or within the range of the threshold value, the equalization process begins. Examiner interprets Sendyk et al's equalization process to be performed within two thresholds: zero being the first and Sendyk et al's disclosure of a threshold being the second. The equalization process begins when the error signal is greater than zero and less than the threshold value. Thus Sendyk et al teach entering into an equalization process when channel changes result in an error rate exceeding a first threshold but not exceeding a second threshold. Therefore, it would have been

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obvious to one of ordinary skill in the art at the time of invention was made to modify Sendyk et al's decision feedback equalization system including threshold comparator and its corresponding threshold value to explicitly disclose a first threshold value. One of ordinary skill in the art would be motivated to do so to provide a minimum value to enter into an equalization process in order to provide precise error detection and equalization in a receiver system.

14. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sendyk et al (US 5,268,930) in view of Roberts (US 7,280,615).

a) Regarding to claim 2, Sendyk et al disclose per-training equalizer using a sequence of symbols (Col 1, L55-60). Sendyk et al does not explicitly disclose that the pre-training process uses long known sequence. However, Roberts discloses training decision feedback equalizer (DFE) uses long preamble (Fig. 22C). The long preamble is useful for DFE (Col 55, L18-57). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention was made to combine Robert's long preamble in training equalization process with the DFE system of Sendyk et al. One of ordinary skill in the art would be motivated to do so to provide maximize transmission speed and achieve a successful acquisition in a poor signal strength environment.



***Allowable Subject Matter***

15. Claims 3-9 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eva Y Puente whose telephone number is 571-272-3049. The examiner can normally be reached on M-F, 7:30 AM to 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chieh Fan can be reached on 571-272-3042. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

April 16, 2009

/Eva Y Puente/  
Examiner, Art Unit 2611